Stability and neutralising capacity of SARS-CoV-2-specific antibodies in convalescent plasma

Tonn, Torsten ; Corman, Victor M ; Johnsen, Matthias ; Richter, Anja ; Rodionov, Roman N ; Drosten, Christian ; Bornstein, Stefan R

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Convalescent plasma is a promising therapeutic strategy that might have benefit in patients with COVID-19,[1,2] despite unproven safety and efficacy. Although randomised clinical trials are ongoing, decision making with regard to the transfusion of convalescent plasma from patients who have recovered from COVID-19 should follow a risk-based approach, whereby the potential risks are minimised in favour of not yet proven therapeutic benefits. WHO Blood Regulators Network and several other stakeholders, such as the International Society of Blood Transfusion, recommend risk mitigation for transfusion-transmissible disease through pathogen inactivation.[3,4] However, at present no data exist regarding the effect of pathogen-inactivation methods or cryopreservation on the stability of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) neutralising antibodies.

We therefore analysed the effect of psoralen and ultraviolet light pathogen inactivation (Intercept Blood System; Cerus, Concord, CA USA) on the total SARS-CoV-2 IgG titre (IgG ELISA; Euroimmun, Lubeck, Germany) and neutralising capacity (life virus assay)[5] in convalescent plasma obtained from patients who have recovered from COVID-19. Our data show that pathogen inactivation of convalescent plasma does not impair the stability and neutralising capacity of SARS-CoV-2-specific antibodies compared with non-pathogen-inactivated controls. Although SARS-CoV-2 IgG titre and neutralising capacity seem to correlate, initial observations from our ongoing convalescent plasma programme at University Hospital Carl-Gustav Carus (Dresden, Germany) have shown that some individual cases have moderate neutralising capacity despite high anti-SARS-CoV-2-IgG titres (appendix). The stability of SARS-CoV-2 IgG and the overall neutralising capacity was also preserved at 100% when the plasma was shock frozen at –30°C after pathogen-inactivation (appendix) or stored as liquid plasma for up to 9 days (data not shown).

Our data suggest that pathogen-inactivation of convalescent plasma from patients who have recovered from COVID-19 does not alter the potential therapeutic potency and should be recommended to mitigate the risk for transfusion associated viral transmission. Considering the currently unproven clinical benefit of convalescent plasma obtained from patients who have had COVID-19, a shift in the risk–benefit ratio towards benefit by means of pathogen-inactivation should be employed in all cases, in settings where the use of pathogen inactivation methods are available and established.

We declare no competing interests.

Torsten Tonn, Victor M Corman, Matthias Johnsen, Anja Richter, Roman N Rodionov, Christian Drosten, Stefan R Bornstein
t.tonn@blutspende.de

Experimental Transfusion Medicine, Faculty of Medicine Carl Gustav Carus, Technical University Dresden, Dresden, Germany (TT); Institute for Transfusion Medicine, German Red Cross Blood Donation Service North East, D-01307 Dresden, Germany (TT, MJ); Charité-Universitätsmedizin Berlin Institute of Virology, Berlin, Germany (VMC, AR, CD); German Centre for Infection Research, Berlin, Germany (VMC, AR, CD); Department of Medicine III, University Hospital Carl-Gustav, Dresden, Germany (RNR, SRB); and Department of Diabetes, School of Life Course Science and Medicine, King´s College London, London, UK (SRB)

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See Online for appendix